Ferroli

GRUPPO FERROLI

ECONCEPT TECH 35 A

ISO 9001 : 2000
CERTIFIED COMPANY

TÜV CERT
DIN EN ISO 9001

cod. 3540I341 – 04/2008 (Rev. 00)

CE

INSTRUCTIONS FOR USE, INSTALLATION AND MAINTENANCE
INSTRUCTIONS D'UTILISATION, D'INSTALLATION ET D'ENTRETIEN
ΟΔΗΓΊΕΣ ΧΡΉΣΗΣ, ΕΓΚΑΤΆΣΤΑΣΗΣ ΚΑΙ ΣΥΝΤΉΡΗΣΗΣ
KULLANMA, KURULUM VE BAKİM TALIMATLARİ

- Carefully read the warnings in this instruction booklet since they provide important information on safe installation, use and maintenance.
- This instruction booklet is an integral part of the product and must be carefully kept by the user for future reference.
- If the unit is sold or transferred to another owner or if it is to be moved, always make sure that the booklet accompanies the boiler so that it can be consulted by the new owner and/or installer.
- Installation and maintenance must be carried out by professionally qualified personnel, according to current regulations and the manufacturer's instructions.
- Incorrect installation or poor maintenance can cause damage or physical injury. The manufacturer declines any responsibility for damage caused by errors in installation and use or by failure to follow the manufacturer's instructions.
- Before carrying out any cleaning or maintenance operation, disconnect the unit from the electrical power supply using the switch and/or the special cut-off devices.
- In case the unit breaks down and/or functions poorly, deactivate it, do not make any attempt to repair it or directly intervene. Contact professionally qualified personnel. Any repair/replacement of products must only be carried out by qualified professional personnel using exclusively genuine parts. Failure to comply with the above could affect the safety of the unit.
- Periodical maintenance carried out by qualified personnel is essential for guaranteeing good operation of the unit.
- This unit must only be used for the purpose for which it was designed. Any other use is considered improper and therefore hazardous.
- After removing the packing, check the integrity of the contents. Packing materials must not be left within the reach of children as they are potentially hazardous.
- In case of doubt do not use the unit, and contact the supplier.
- The images shown in this manual are a simplified representation of the product. In this representation there may be slight, unimportant differences with the supplied product.

⚠	This symbol indicates **"Caution"** and is placed next to all safety warnings. Strictly follow these instructions in order to avoid danger and damage to persons, animals and things.
☞	This symbols calls attention to a note or important notice.

Declaration of conformity

CE

Manufacturer: FERROLI S.p.A.

Address: Via Ritonda 78/a 37047 San Bonifacio VR Italy

declares that this unit complies with the following EU directives:

- Gas Appliance Directive 90/396
- Efficiency Directive 92/42
- Low Voltage Directive 73/23 (amended by 93/68)
- Electromagnetic Compatibility Directive 89/336 (amended by 93/68)

President and Legal Representative
Cav. del Lavoro
Dante Ferroli

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1. Operating instructions

1.1 Introduction

Dear Customer,

Thank you for choosing a **ECONCEPT TECH 35 A** wall-mounted boiler featuring **FERROLI**advanced design, cutting-edge technology, high reliability and quality construction. Please read this manual carefully since it provides important information on safe installation, use and maintenance.

ECONCEPT TECH 35 A is a high-efficiency **condensation pre-mixed** heat generator with an an airtight chamber for heating and hot water production (with optional external water heater) with extremely low emissions, running on natural gas or LPG and equipped with a microprocessor control system.

The **boiler shell** consists of an aluminium laminar exchanger and a ceramic **pre-mixed burner** equipped with electronic ignition and ionization flame control, modulating speed fan and modulating gas valve.

The boiler is arranged for connection to an **external storage tank for hot water production** (optional). In this manual all the functions relevant to domestic hot water production are only active with the optional hot water tank connected as indicated in sec. 2.3.

1.2 Control panel

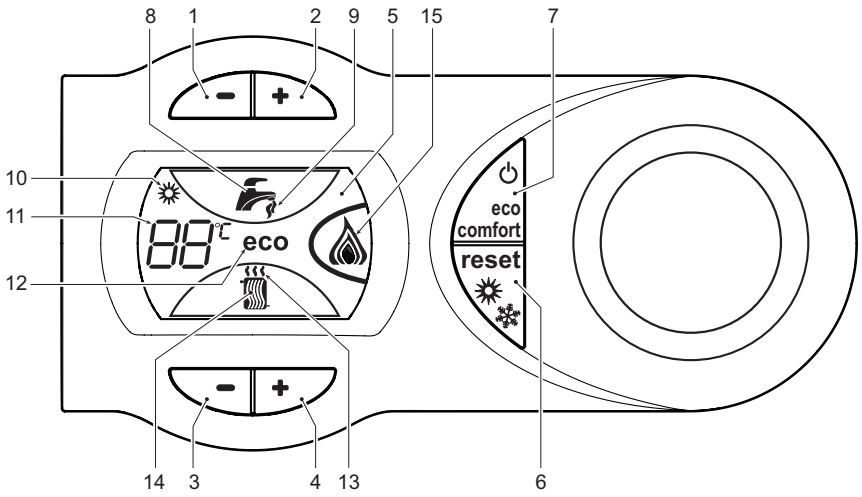


fig. 1 - Control panel

Key

1 = DHW temperature setting decrease button
2 = DHW temperature setting increase button
3 = Heating system temperature setting decrease button
4 = Heating system temperature setting increase button
5 = Display
6 = Summer/Winter mode selection - Reset button - "Sliding Temperature" Menu
7 = Unit On/Off - Economy/Comfort mode selection button
8 = DHW symbol
9 = DHW circuit operation
10 = Summer mode
11 = Multifunction (blinking during the exchanger protection function)
12 = Eco (Economy) mode
13 = Heating operation
14 = Heating symbol
15 = Burner On and actual power (blinking during the flame protection function)

Indication during operation

Heating

A heating demand (generated by the Room Thermostat or Remote Timer Control) is indicated by flashing of the hot air above the radiator (details 13 and 14 - fig. 1).

The display (detail 11 - fig. 1) shows the actual heating delivery temperature and during DHW standby time, the message **"d2"**.

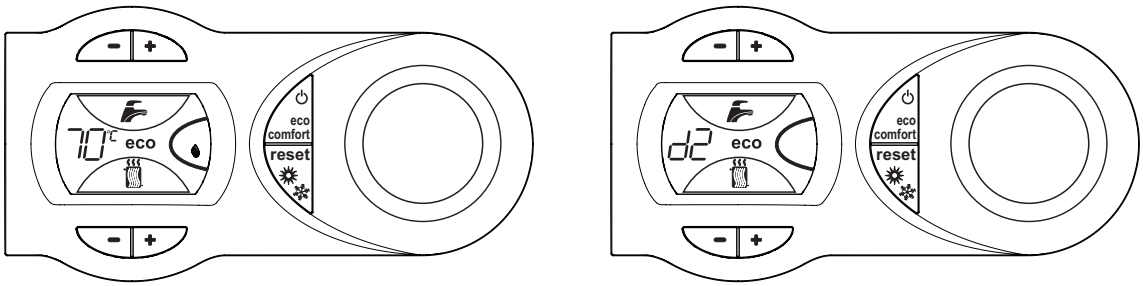


fig. 2

Hot water

A DHW demand (generated by drawing domestic hot water) is indicated by flashing of the hot water under the tap (details 8 and 9 - fig. 1).

The display (detail 11 - fig. 1) shows the actual hot water outlet temperature and, during DHW standby time, the message **"d1"**.

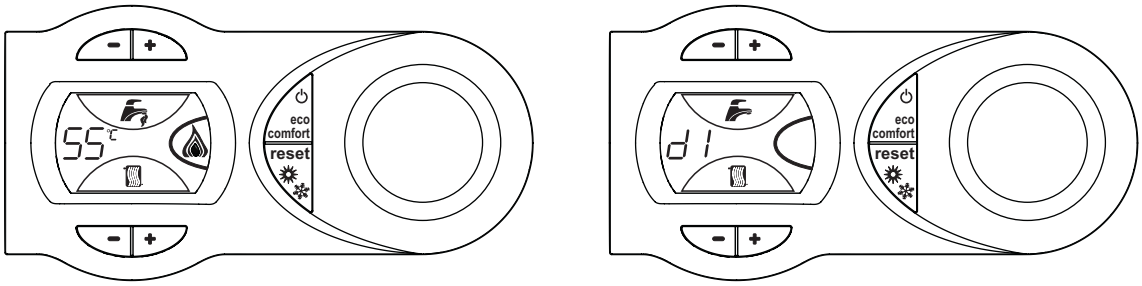


fig. 3

Exclude hot water storage tank (economy)

Hot water storage tank temperature maintaining/heating can be excluded by the user. If excluded, domestic hot water will not be delivered.

The hot water tank can be deactivated by the user (ECO mode) by pressing the ECO/COMFORT button (detail 7 - fig. 1). In ECO mode the display activates the ECO symbol (detail 12 - fig. 1). To activate COMFORT mode, press the ECO/COMFORT button (detail 7 - fig. 1) again.

1.3 Turning on and off

Boiler lighting

Switch on the power to the unit.

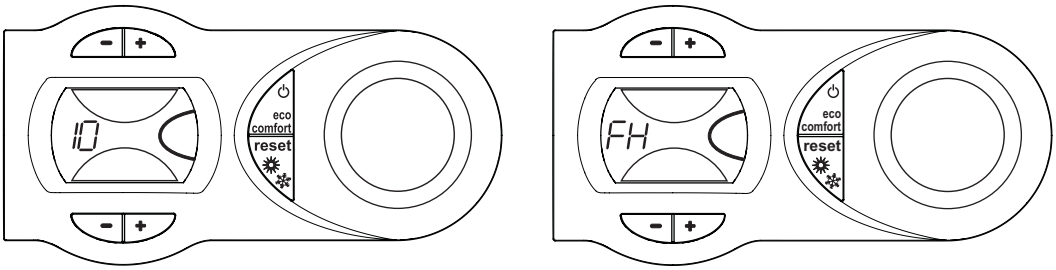


fig. 4 - Boiler lighting

- For the following 120 seconds the display will show FH which identifies the heating system air venting cycle.
- During the first 5 seconds the display will also show the card software release.
- Open the gas cock ahead of the boiler.
- When the message FH disappears, the boiler will be ready to operate automatically whenever domestic hot water is drawn or in case of a room thermostat demand.

Turning the boiler off

Press the button (detail 7 - fig. 1) for 5 seconds.

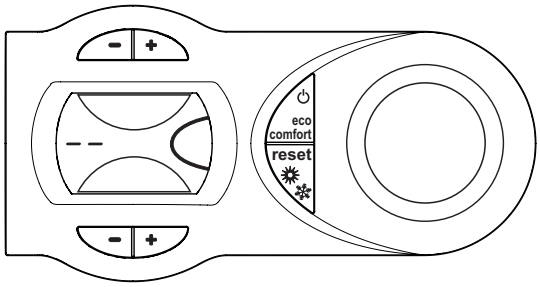


fig. 5 - Turning the boiler off

When the boiler is turned off, the electronic board is still powered.

Domestic hot water and heating operation are disabled. The antifreeze system remains activated.

To relight the boiler, press the button (detail 7 fig. 1) again for 5 seconds.

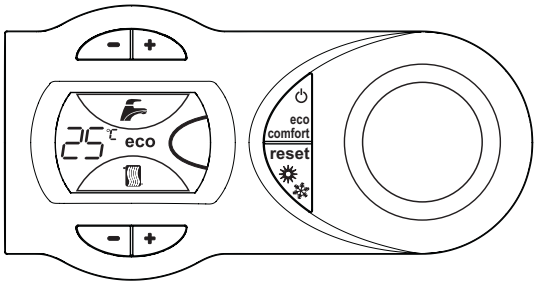


fig. 6

The boiler will be immediately ready to operate whenever domestic hot water is drawn or in case of a room thermostat demand.

The antifreeze system does not work when the power and/or gas to the unit are turned off. To avoid damage caused by freezing during long idle periods in winter, it is advisable to drain all water from the boiler, DHW circuit and system; or drain just the DHW circuit and add a suitable antifreeze to the heating system, complying with that prescribed in sec. 2.3.

1.4 Adjustments

Summer/Winter changeover

Press the button (detail 6 - fig. 1) for 2 seconds.

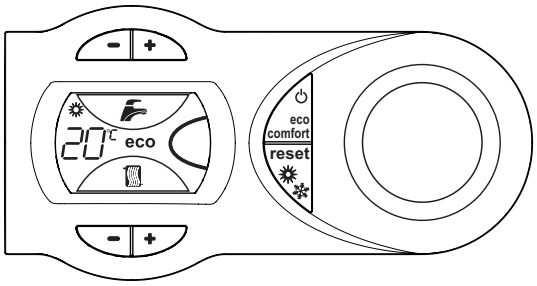


fig. 7

The display activates the Summer symbol (detail 10 - fig. 1): the boiler will only deliver domestic hot water. The anti-freeze system remains activated.

To deactivate Summer mode, press the button (detail 6 - fig. 1) again for 2 seconds.

Heating temperature adjustment

Operate the heating buttons (details 3 and 4 -) to adjustfig. 1the temperature from a min. of 20 °C to a max. of 90 °C.

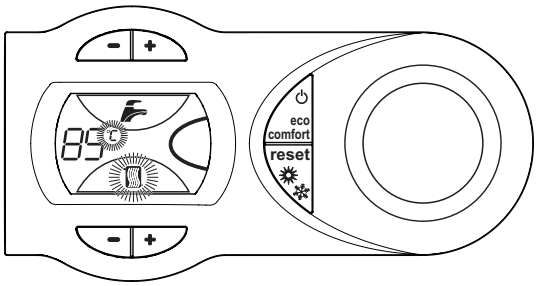


fig. 8

Hot water temperature adjustment

Operate the DHW buttons (detail 1 and 2 - fig. 1) to adjust the temperature from a min. of 10°C to a max. of 65°C.

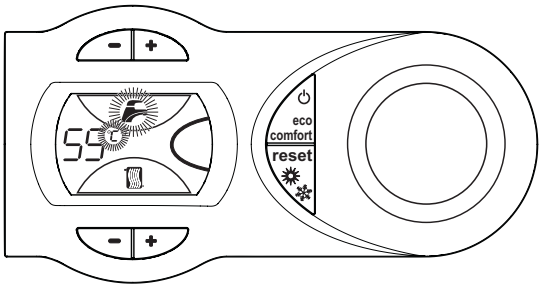


fig. 9

Room temperature adjustment (with optional room thermostat)

Using the room thermostat, set the temperature desired in the rooms. If the room thermostat is not installed the boiler will keep the heating system at its setpoint temperature.

Room temperature adjustment (with optional remote timer control)

Using the remote timer control, set the temperature desired in the rooms. The boiler unit will set the system water according to the required room temperature. For information on the remote timer control, please refer to its user's manual.

Sliding temperature

When the optional external probe is installed the boiler adjustment system works with "Sliding Temperature". In this mode, the temperature of the heating system is adjusted according to the outside weather conditions, in order to ensure high comfort and energy saving throughout the year. As the outside temperature increases, the temperature of the heating system is decreased according to a fixed "compensation curve".

With Sliding Temperature adjustment, the temperature set with the heating buttons (details 3 and 4 - fig. 1) becomes the maximum system delivery temperature. It is advisable to set a maximum value to allow system adjustment throughout its useful operating range.

The boiler must be adjusted at the time of installation by qualified personnel. Possible adjustments can in any case be made by the user to improve comfort.

Compensation curve and curve offset

Press the button (detail 6 - fig. 1) for 5 seconds to access the "Sliding temperature" menu; "CU" appears flashing (fig. 10).

Operate the DHW buttons (details 1 and 2 - fig. 1) to adjust the required curve from 1 to 10 according to the characteristic (fig. 12). By setting the curve to 0, sliding temperature adjustment is disabled.

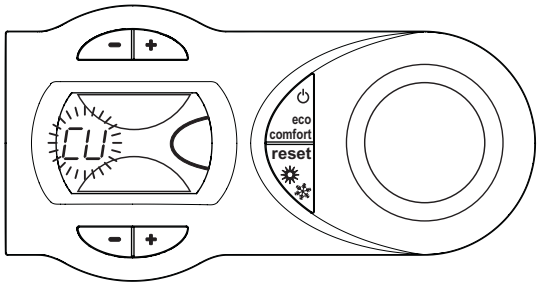


fig. 10 - Compensation curve

Press the heating buttons (details 3 and 4 - fig. 1) to access parallel curve offset; "OF" appears flashing (fig. 11). Operate the DHW buttons (details 1 and 2 - fig. 1) to adjust parallel curve offset according to the characteristic (fig. 13).

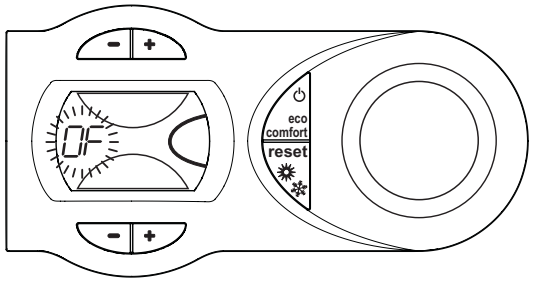


fig. 11 - Parallel curve offset

Press the button (detail 6 - fig. 1) again for 5 seconds to exit the “Sliding Temperature” menu.

If the room temperature is lower than the required value, it is advisable to set a higher order curve and vice versa. Proceed by increasing or decreasing in steps of one and check the result in the room.

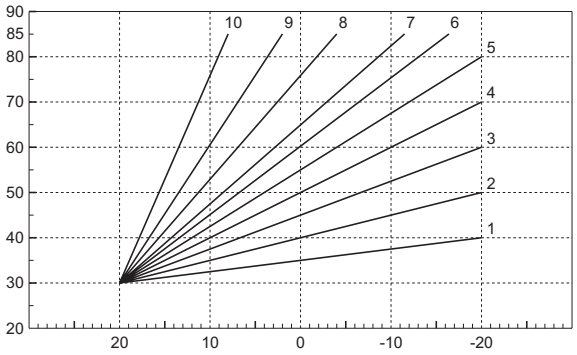


fig. 12 - Compensation curves

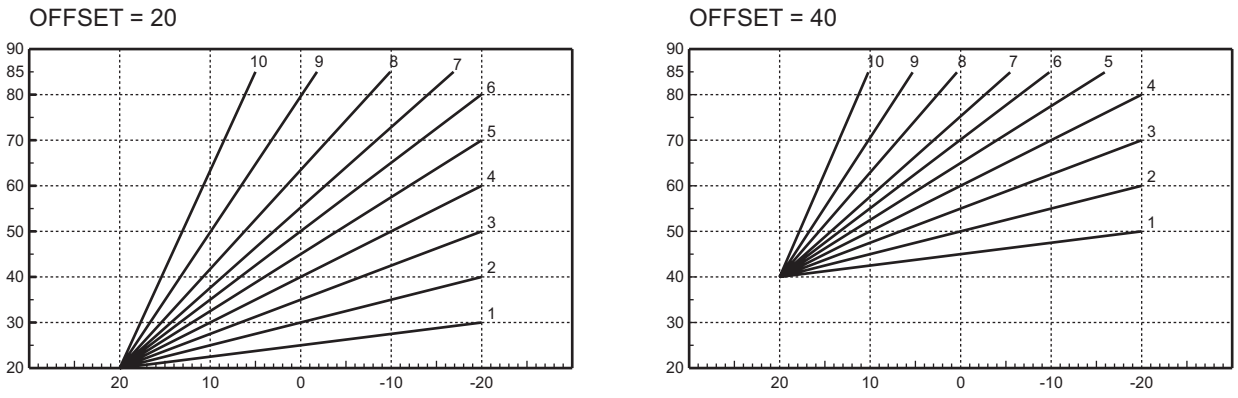


fig. 13 - Example of parallel compensation curve shift

If the Remote Timer Control (optional) is connected to the boiler, the above adjustments are managed according to that given in table 1.

Table. 1

Heating temperature adjustment	Adjustment can be made from the Remote Timer Control menu and the boiler control panel.
DHW temperature adjustment	Adjustment can be made from the Remote Timer Control menu and the boiler control panel.
Summer/Winter changeover	Summer mode has priority over a possible Remote Timer Control heating demand.
Eco/Comfort selection	On disabling DHW from the Remote Timer Control menu, the boiler selects the Economy mode. In this condition, the button (detail 7 - fig. 1) on the boiler panel is disabled.
	On enabling DHW from the Remote Timer Control menu, the boiler selects the Comfort mode. In this condition it is possible select one of the two modes with the button (detail 7 - fig. 1) on the boiler panel.
Sliding Temperature	Both the Remote Timer Control and the boiler card manage Sliding Temperature adjustment: of the two, the boiler card Sliding Temperature has priority.

Water system pressure adjustment

The filling pressure with system cold, read on the boiler water gauge, must be approx. 1.0 bar. If the system pressure falls to values below minimum, the boiler card will activate fault F37 (fig. 14).

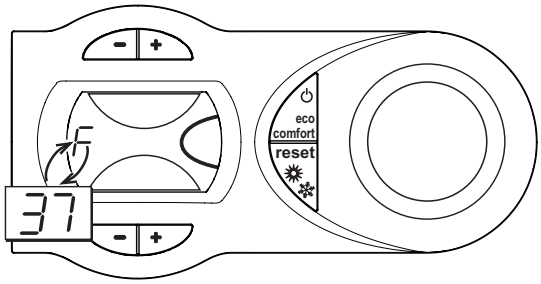


fig. 14 - Low system pressure fault

Operate the filling cock (detail 1 - fig. 15) and bring the system pressure to a value above 1.0 bar.

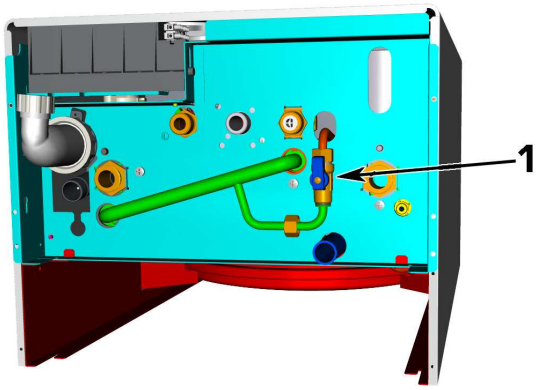


fig. 15 - Filling cock

Once the system pressure is restored, the boiler will activate the 120-second air venting cycle indicated on the display by FH.

At the end of the operation always close the filling cock (detail 1 - fig. 15)

2. Installation

2.1 General Instructions

BOILER INSTALLATION MUST ONLY BE PERFORMED BY QUALIFIED PERSONNEL, IN ACCORDANCE WITH ALL THE INSTRUCTIONS GIVEN IN THIS TECHNICAL MANUAL, THE PROVISIONS OF CURRENT LAW, THE PRESCRIPTIONS OF NATIONAL STANDARDS AND LOCAL REGULATIONS AND THE RULES OF PROPER WORKMANSHIP

2.2 Place of installation

The combustion circuit is sealed with respect to the place of installation, therefore the unit can be installed in any room. However, the place of installation must be sufficiently ventilated to prevent the creation of any dangerous conditions in case of even small gas leaks. This safety precaution is required by EEC Directive no. 90/396 for all gas units, including those with a so-called sealed chamber.

Therefore the place of installation must be free of dust, flammable materials or objects or corrosive gases. The room must be dry and not subject to freezing.

The boiler is arranged for wall mounting and comes standard with a hooking bracket. The wall fixing must ensure stable and effective support for the generator.

If the unit is enclosed in a cabinet or mounted alongside, a space must be provided for removing the casing and for normal maintenance operations

2.3 Plumbing connections

The heating capacity of the unit must be previously established by calculating the building's heat requirement according to current regulations. The system must be provided with all the components for correct and regular operation. It is advisable to install shut-off valves between the boiler and heating system allowing the boiler to be isolated from the system if necessary.

The safety valve outlet must be connected to a funnel or collection pipe to prevent water spurting onto the floor in case of overpressure in the heating circuit. If this is not done, and the drain valve trips and floods the room, the boiler manufacturer is not to be held responsible.

Do not use the water system pipes to earth electrical appliances.

Before installation, carefully flush all the pipes of the system to remove residues or impurities that could impair the operation of the unit.

In addition, a filter must be installed on the system return piping to prevent debris or sludge from the system clogging and damaging the heat generators.

The filter MUST be installed when replacing generators in existing systems. The manufacturer shall not be held liable for any damage caused to the generator by failure to install or inadequate installation of this filter.

Make the connections to the corresponding connections as shown on the drawing in sec. 4.1 and by the symbols on the unit.

On request, it is possible to supply the connecting kits shown in the figure below.

A - Female sleeve
B - OT 58 nipple
C - O-ring
D - OT 58 clamping ring
E - Copper washer
F - OT 58 fitting
G - Ball cock

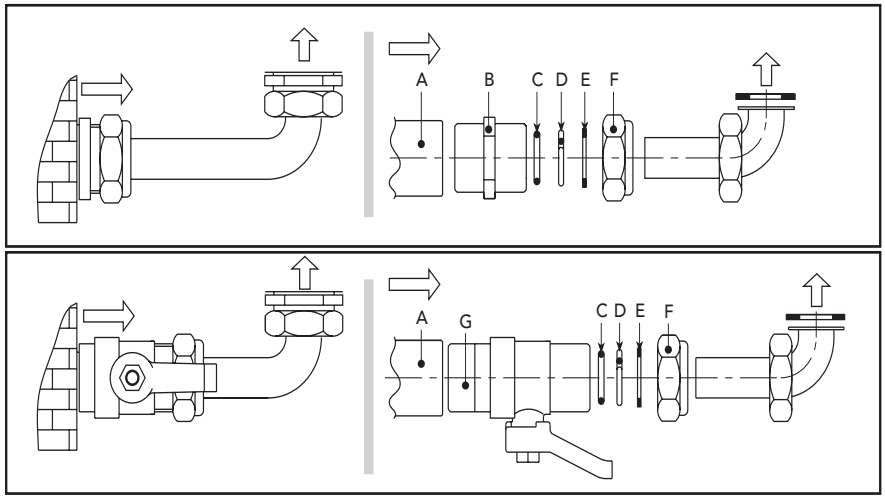


fig. 16 - Connection kits

System water charcteristics

In the presence of water harder than 25° Fr (1°F = 10ppm $CaCO_3$), the use of suitably treated water is advisable in order to avoid possible scaling in the boiler. The treatment must not in any case reduce the hardness to values below 15°F (Decree 236/88 for uses of water intended for human consumption). Water treatment is indispensable in the case of very large systems or with frequent replenishing of water in the system. If partial or total emptying of the system becomes necessary in these cases, it is advisable to refill it with treated water.

Antifreeze system, antifreeze fluids, additives and inhibitors

The boiler is equipped with an antifreeze system that turns on the boiler in heating mode when the system delivery water temperature falls under 6°C. The device will not come on if the electricity and/or gas supply to the unit are cut off. If it becomes necessary, it is permissible to use antifreeze fluid, additives and inhibitors only if the manufacturer of these fluids or additives guarantees they are suitable for this use and cause no damage to the heat exchanger or other components and/or materials of the boiler unit and system. It is prohibited to use generic antifreeze fluid, additives or inhibitors that are not expressly suited for use in heating systems and compatible with the materials of the boiler unit and system.

Connection to a storage tank for domestic hot water production

The unit's electronic board is arranged for managing an external storage tank for domestic hot water production. Make the plumbing connections according to the diagram of fig. 17. Make the electrical connections as shown on the wiring diagram in sec. 4.6. It is necessary to use the kit code 1KWMA11W. At the next lighting, the boiler's control system recognises the presence of the hot water tank probe and automatically configures the DHW function, activating the display and relevant controls.

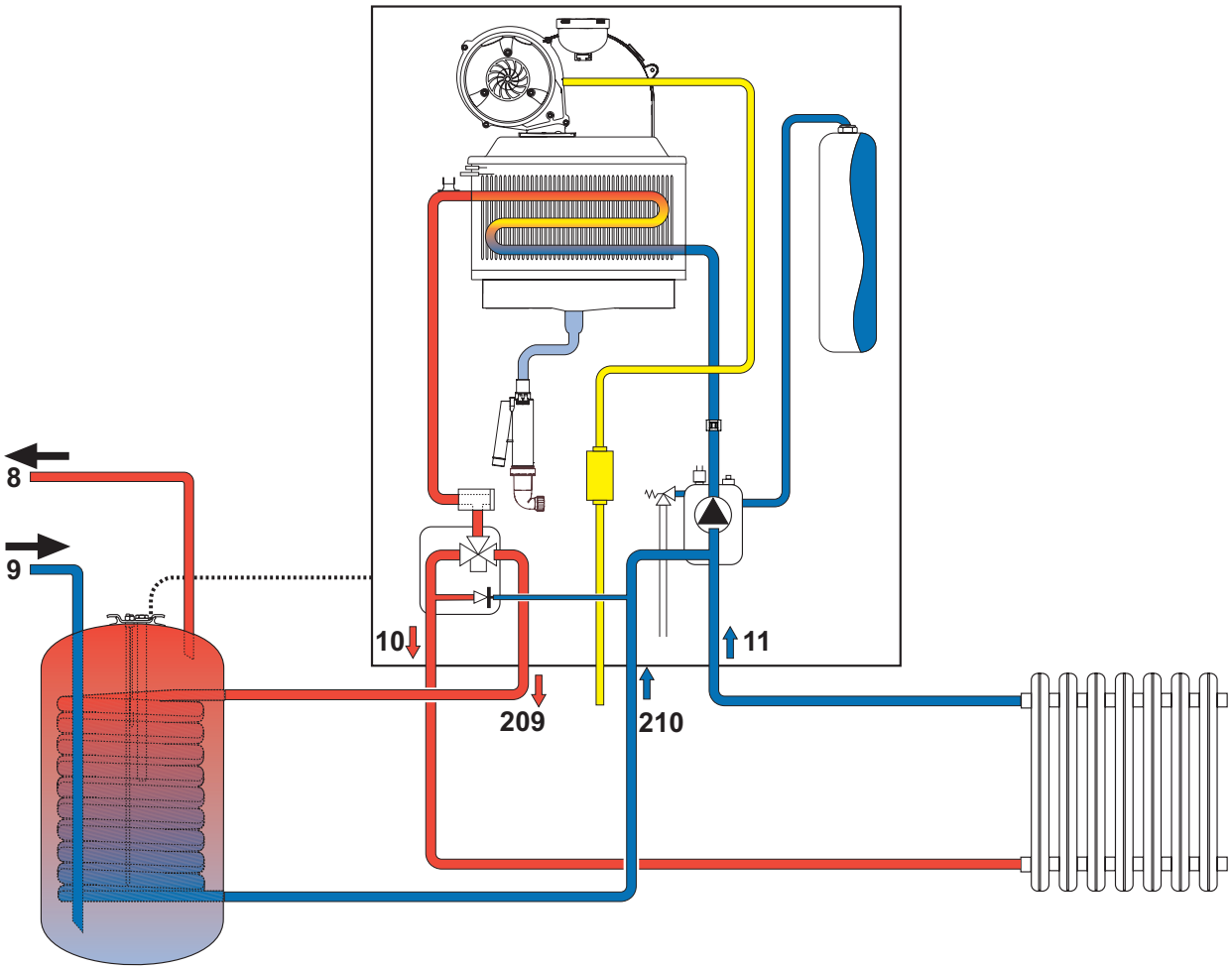


fig. 17 - Diagram of connection to external hot water tank

8 Sanitary hot water outlet
9 Tap water inlet
10 System delivery
11 System return
209 Boiler delivery
210 Boiler return

2.4 Gas connection

Before making the connection, ensure that the unit is arranged for operation with the type of fuel available and carefully clean all the pipes of the gas system to remove any residues that could affect good functioning of the boiler.

The gas must be connected to the relative connector (see fig. 31) in conformity with current standards, with rigid metal pipes or with continuous flexible s/steel wall tubing, placing a gas cock between the system and the boiler. Make sure that all the gas connections are tight. The capacity of the gas meter must be sufficient for the simultaneous use of all equipment connected to it. The diameter of the gas pipe leaving the boiler does not determine the diameter of the pipe between the unit and the meter; it must be chosen according to its length and loss of head, in conformity with current standards.

Do not use the gas pipes to earth electrical appliances.

2.5 Electrical connections

Connection to the electrical grid

The unit's electrical safety is only guaranteed when correctly connected to an efficient earthing system executed according to current safety standards. Have the efficiency and suitability of the earthing system checked by professionally qualified personnel. The manufacturer is not responsible for any damage caused by failure to earth the system. Also make sure that the electrical system is adequate for the maximum power absorbed by the unit, as specified on the boiler dataplate.

The boiler is prewired and provided with a Y-cable and plug for connection to the electricity line. The connections to the grid must be made with a permanent connection and equipped with a bipolar switch whose contacts have a minimum opening of at least 3 mm, interposing fuses of max. 3A between the boiler and the line. It is important to respect the polarities (LINE: brown wire / NEUTRAL: blue wire / EARTH: yellow-green wire) in making connections to the electrical line. During installation or when changing the power cable, the earth wire must be left 2 cm longer than the others.

The user must never change the unit's power cable. If the cable gets damaged, switch off the unit and have it changed solely by professionally qualified personnel. If changing the electric power cable, use solely **"HAR H05 VV-F"** 3x0.75 mm2 cable with a maximum outside diameter of 8 mm.

Room thermostat (optional)

CAUTION: The room thermostat must have clean contacts. CONNECTING 230 V. TO THE TERMINALS OF THE ROOM THERMOSTAT WILL IRREPARABLY DAMAGE THE ELECTRONIC CARD.

When connecting a remote timer control or a timer switch, do not take the power supply for these devices from their cut-out contacts. Their power supply must be taken with a direct connection from the mains or with batteries, depending on the kind of device.

External probe (optional)

Connect the probe to its respective terminals. The maximum permissible length for the boiler - external probe connection electrical cable is 50 m. A normal 2-wire cable can be used. The external probe should preferably be installed on the North, North-West wall or that facing the largest area of living room. The probe must never be exposed to the early morning sun or, insofar as possible, direct sunlight; protect it if necessary. In any case, the probe must not be installed near windows, doors, ventilation openings, flues or heat sources that could affect the reading.

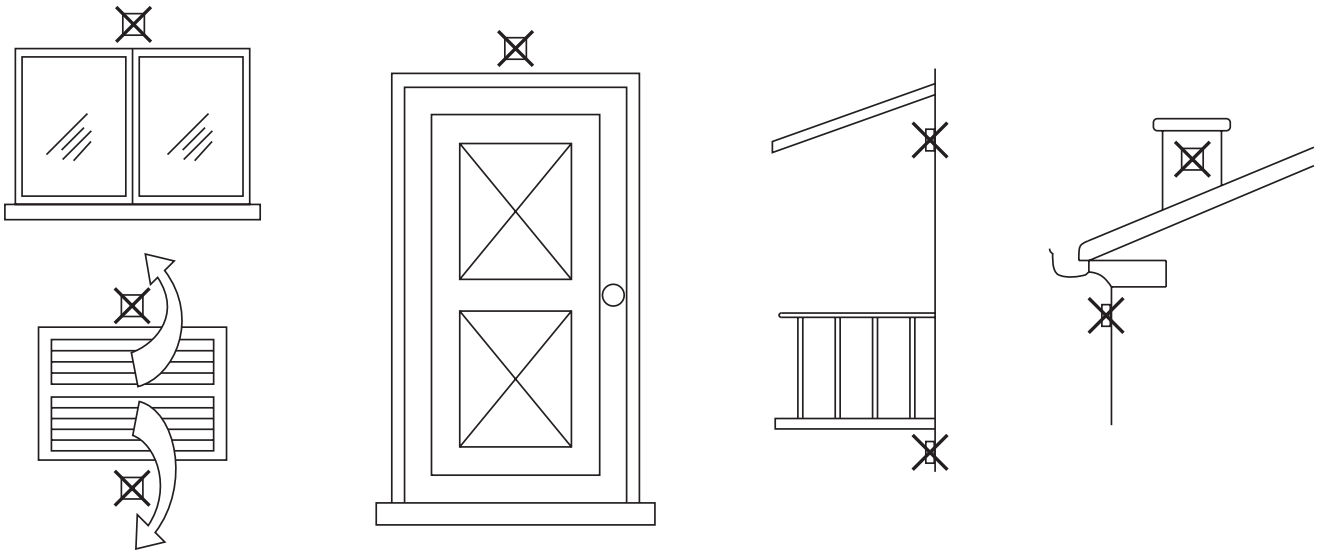


fig. 18 - External probe positioning not recommended

Access to the electrical terminal board

Follow the instructions given in fig. 19 to access the electrical connection terminal board. The layout of the terminals for the various connections is given in the wiring diagram in fig. 34.

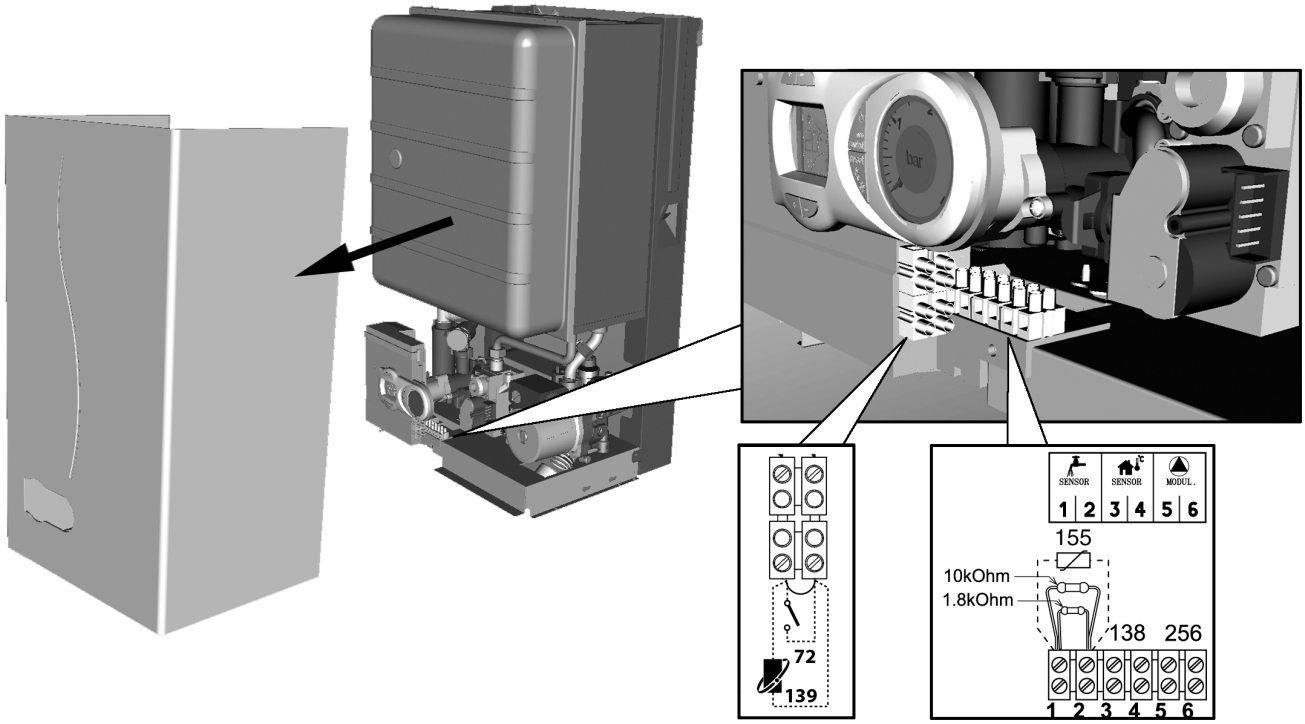


fig. 19 - Access to the electrical terminal board

2.6 Fume ducts

The unit is “type C” with an airtight chamber and forced draught, the air inlet and fume outlet must be connected to one of the following extraction/suction systems. The unit is type-approved to work with all the Cxy flue configurations stated on the technical data plate (some setups are given by way of example in this chapter). It is however possible that some setups are expressly limited or not permitted by law, standards or local regulations. Before proceeding with installation, check and meticulously observe the above-mentioned prescriptions. In addition, comply with the provisions concerning the positioning of wall and/or roof end pieces and the minimum distances from windows, walls, ventilation openings, etc.

This C-type unit must be installed using the fume extraction and outlet ducts supplied by the manufacturer in accordance with UNI-CIG 7129/92. Failure to use them automatically forfeits all warranty and liability of the manufacturer.

For fume exhaust pipes longer than 1 metre, during installation take in account the natural expansion of the materials when the boiler is operating.

To prevent deformations leave an expansion space of approx. 2 ÷ 4 mm for every metre of pipe.

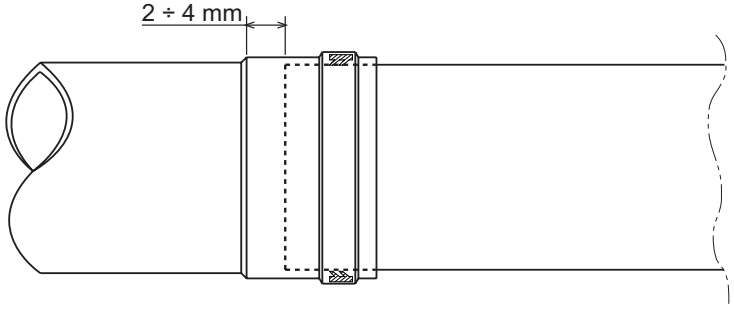


fig. 20 - Expansion

Connection with coaxial pipes

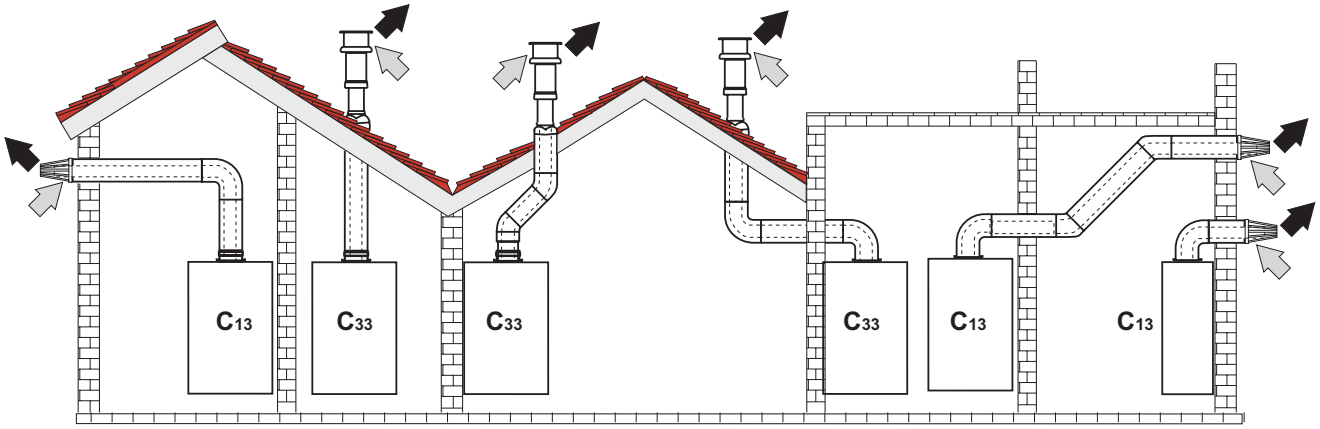


fig. 21 - Examples of connection with coaxial pipes (⇨ = Air / ➡ = Fumes)

For coaxial connection, fit the unit with one of the following starting accessories. For the wall hole dimensions, refer to sec. 4.1. Any horizontal sections of the fume exhaust must be kept sloping slightly towards the boiler, to prevent possible condensate from flowing back towards the outside and causing dripping.

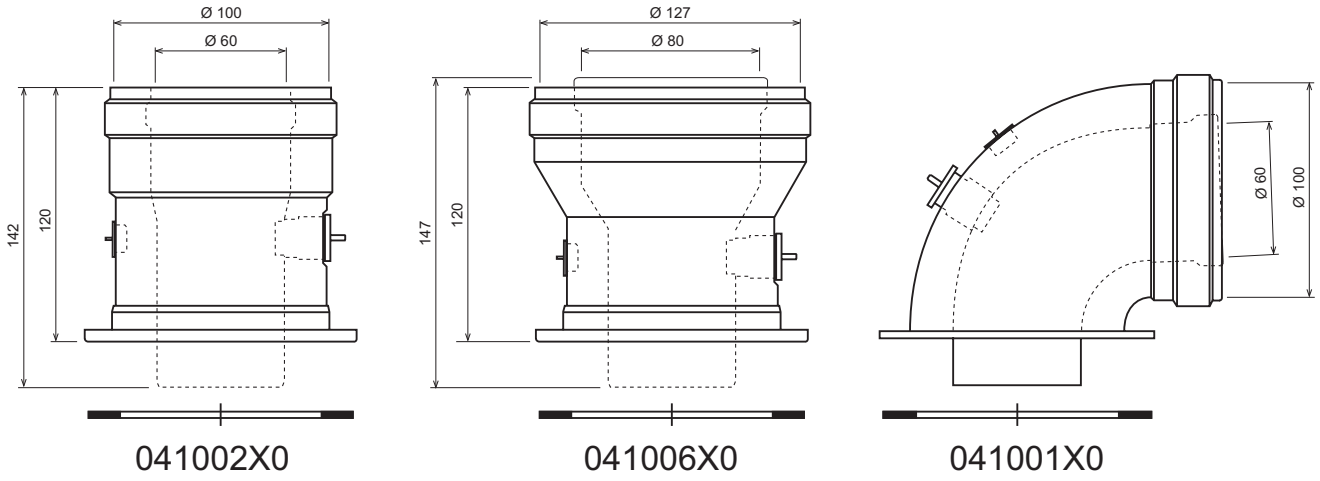


fig. 22 - Starting accessory for coaxial ducts

Before proceeding with installation, check with table 2 that the maximum permissible length is not exceeded, bearing in mind that every coaxial bend gives rise to the reduction indicated in the table. For example, a Ø 60/100 duct comprising a 90° bend + 1 horizontal metre has a total equivalent length of 2 metres.

Table. 2 - Max. length coaxial ducts

	Coaxial 60/100	Coaxial 80/125
Max. permissible length	**5 m**	**15 m**
Reduction factor 90° bend	1 m	0.5 m
Reduction factor 45° bend	0.5 m	0.25 m

Connection with separate pipes

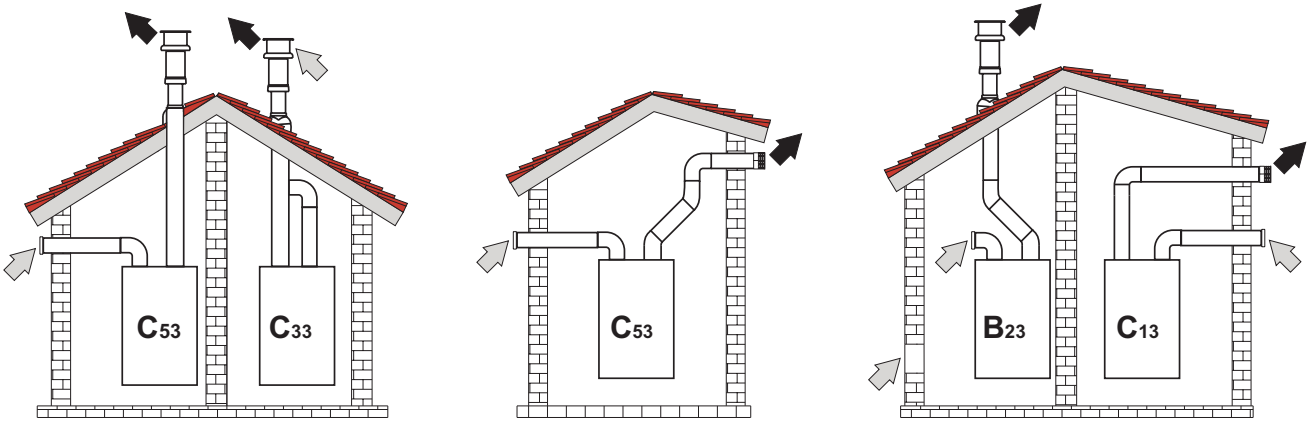


fig. 23 - Examples of connection with separate pipes (= Air / = Fumes)

For connection of the separate ducts, fit the unit with the following starting accessory:

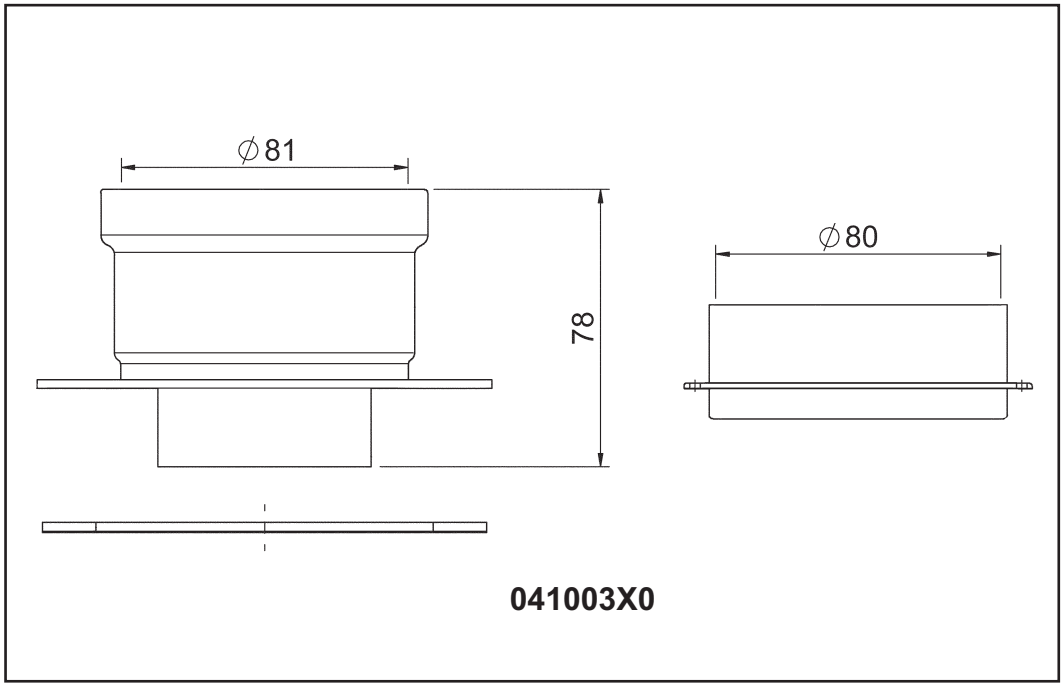


fig. 24 - Starting accessory for separate ducts

Before proceeding with installation make sure the maximum permissible length has not been exceeded, by means of a simple calculation:

1. Completely establish the layout of the system of split flues, including accessories and outlet terminals.
2. Consult the table 4 and identify the losses in m_{eq} (equivalent metres) of every component, according to the installation position.
3. Check that the sum total of losses is less than or equal to the maximum permissible length in table 3.

Table. 3 - Max. length separate ducts

	Separate ducts
Max. permissible length	55 m_{eq}

Table. 4 - Accessories

				Losses in m_{eq}		
				Air inlet	Fume exhaust	
					Vertical	Horizontal
Ø 80	PIPE	1 m M/F	1KWMA83W	1.0	1.6	2.0
	BEND	45° M/F	1KWMA65W	1.2	1.8	
		90° M/F	1KWMA01W	1.5	2.0	
	PIPE SECTION	with test point	1KWMA70W	0.3	0.3	
	TERMINAL	air, wall	1KWMA85A	2.0	-	
		fumes, wall with antiwind	1KWMA86A	-	5.0	
	FLUE	Split air/fumes 80/80	1KWMA84U	-	12.0	

Connection to collective flues

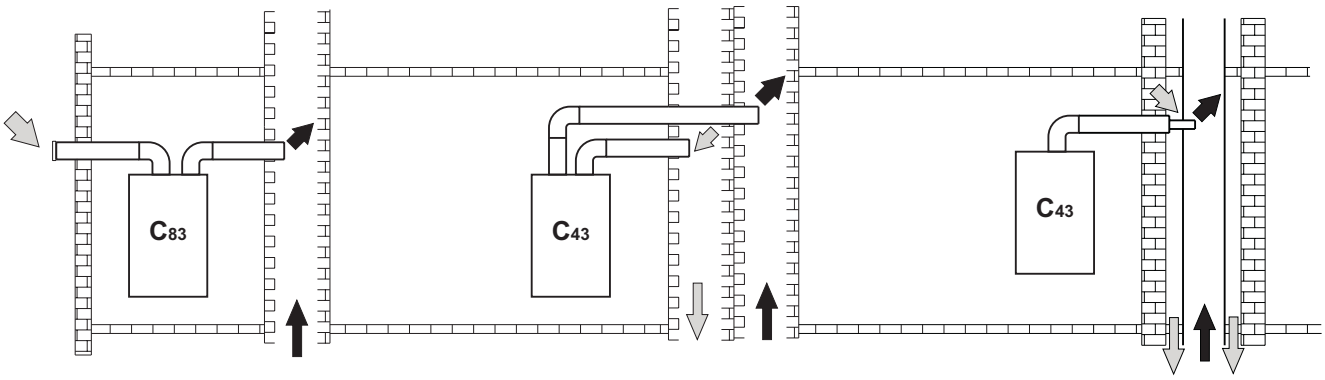


fig. 25 - Examples of connection to flues (= Air / = Fumes)

If you are then going to connect the **ECONCEPT TECH 35 A** boiler to a collective flue or a single flue with natural draught, the flue must be expressly designed by professionally qualified technical personnel in conformity with the current standards and be suitable for airtight chamber units equipped with a fan.

In particular, flues must have the following characteristics:

- Be sized according to the method of calculation stated in the current standards.
- Be airtight to the products of combustion, resistant to the fumes and heat and waterproof for the condensate.
- Have a circular or quadrangular cross-section, with a vertical progression and with no constrictions.
- Have the ducts conveying the hot fumes adequately distanced or isolated from combustible materials.
- Be connected to just one unit per floor.
- Be connected to just one type of unit (or all and only forced draught units or all and only natural draught units).
- Have no mechanical suction devices in the main ducts.
- Be at a lower pressure, all along their length, under conditions of stationary operation.
- Have at their base a collection chamber for solid materials or condensation equipped with a metal door with an airtight closure.

2.7 Condensate drain connection

The boiler is equipped with a trap to drain condensate. Fit the inspection connection **A** and the flexible tube **B**, pressing it in about 3 cm and securing it with a clamp. Fill the trap with approx. 0.5 l. of water and connect the flexible tube to the elimination system.

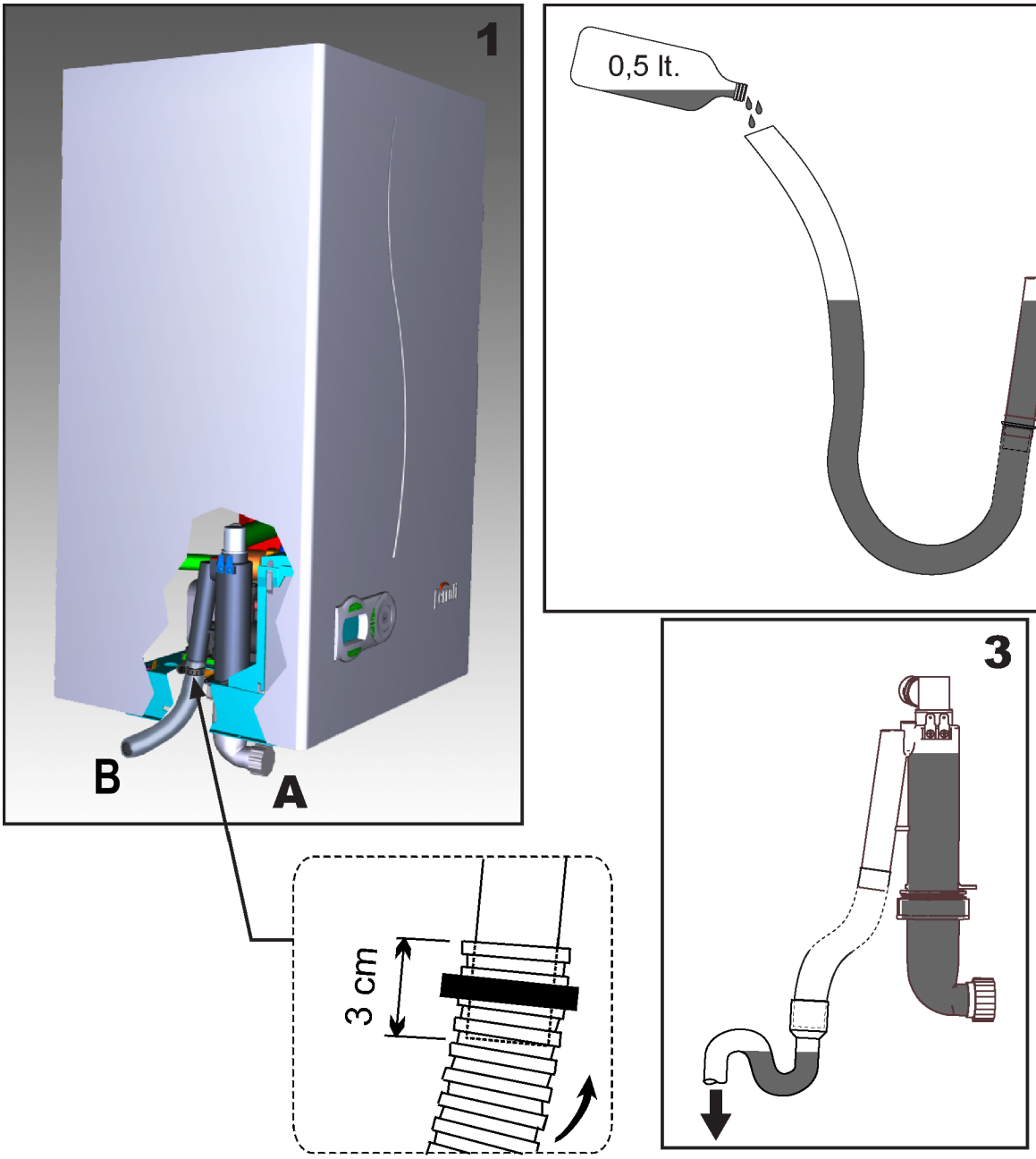


fig. 26 - Condensate drain connection

3. Service and maintenance

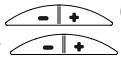
All adjustment, conversion, start-up and maintenance operations described below must only be carried out by Qualified Personnel (meeting the professional technical requirements prescribed by current regulations) such as those of the Local After-Sales Technical Service.

FERROLI declines any liability for damage and/or injury caused by unqualified and unauthorised people tampering with the unit.

3.1 Adjustments

Gas supply conversion

The unit can operate on Natural Gas or LPG and is factory-set for use with one of these two gases, as clearly shown on the packing and on the dataplate. Whenever a different gas to that for which the unit is arranged has to be used, a conversion kit will be required, proceeding as follows:

1. Remove the casing.
2. Open the sealed chamber.
3. Release the fixing clip **C** and remove the gas pipe**A** from the fan - venturi assembly.
4. Replace the nozzle **B** inserted in the gas pipe with that contained in the conversion kit.
5. Reassemble the gas pipe **A** with the clip and check the seal of the connection.
6. Apply the plate contained in the conversion kit, near the dataplate.
7. Refit the sealed chamber and casing.
8. Modify the parameter for the type of gas:
   - switch the boiler to standby mode
   - press the DHW buttons  (detail 1 and 2 - fig. 1) for 10 seconds: the display shows "**P01**" flashing.
   - press the DHW buttons (details 1 and 2 - fig. 1) to set the parameter **00** (for operation with natural gas) or **01** (for operation with LPG).
   - press the DHW buttons (details 1 and 2 - fig. 1) for 10 seconds.
   - the boiler will return to the standby mode
9. Using a combustion analyser connected to the boiler fume outlet, check that the CO 2 content in the fumes (with the boiler operating at max. and min. output) complies with the value given in the technical data table for the corresponding gas type.

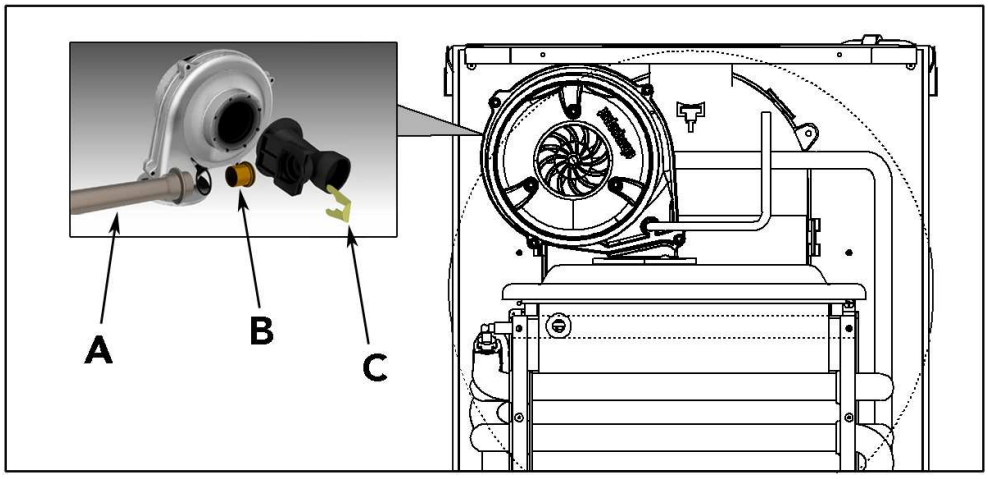


fig. 27 - Gas supply conversion

Activating TEST mode

Press the heating buttons (details 3 and 4 -) at the same time for 5fig. 1seconds to activate TEST **mode**. The boiler lights at the maximum heating power set as described in the following section.

The heating symbol (detail 14 - fig. 1) and DHW symbol (detail 8 - fig. 1) flash on the display; the heating power will be displayed alongside.

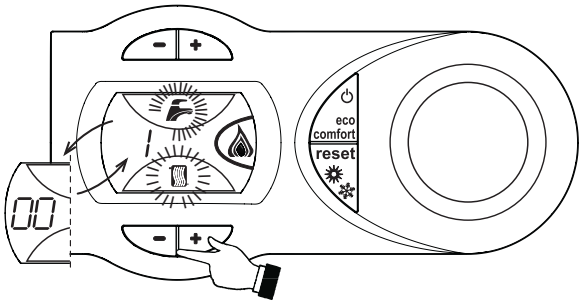


fig. 28 - TEST mode (heating power = 100%)

To deactivate TEST mode, repeat the activation sequence.

In any case, the TEST mode is disabled automatically after 15 minutes.

Heating power adjustment

To adjust the heating power, switch the boiler to TEST mode (see sec. 3.1). Press the heating buttons (details 3 and 4 - fig. 1) to increase or decrease the power (min. = 00 - max. = 100). Press the RESET button within 5 seconds; the max. power will remain that just set. Exit TEST mode (see sec. 3.1).

3.2 Start-up

Checks to be made at first lighting, and after all maintenance operations that involved disconnection from the systems or an operation on safety devices or parts of the boiler:

Before lighting the boiler

- Open any on-off valves between the boiler and the systems.
- Check the tightness of the gas system, proceeding with caution and using a soap and water solution to detect any leaks in connections.
- Check correct prefilling of the expansion tank (ref. sec. 4.4).
- Fill the water system and make sure all air contained in the boiler and the system has been vented, by opening the air vent valve on the boiler and any vent valves on the system.
- Fill the condensate trap and check correct connection of the condensate elimination system.
- Make sure there are no water leaks in the system, DHW circuits, connections or boiler.
- Check correct connection of the electrical system and efficiency of the earthing system
- Make sure the gas pressure value for heating is that required.
- Make sure there are no flammable liquids or materials in the immediate vicinity of the boiler

Checks during operation

- Turn the unit on as described in sec. 1.3.
- Make sure the fuel circuit and water systems are tight.
- Check the efficiency of the flue and air-fume ducts while the boiler is working.
- Check the correct tightness and functionality of the condensate elimination system and trap.
- Make sure the water is circulating properly between the boiler and the systems.
- Make sure the gas valve modulates correctly in the heating and domestic hot water production phases.
- Check proper boiler lighting by doing several tests, turning it on and off with the room thermostat or remote control.
- Using a combustion analyser connected to the boiler fume outlet, check that the CO_2 content in the fumes, with the boiler operating at max. and min. output, corresponds to that given in the technical data table for the corresponding type of gas.
- Make sure the fuel consumption indicated on the meter matches that given in the technical data table on sec. 4.4.
- Check the correct programming of the parameters and carry out any necessary customization (compensation curve, power, temperatures, etc.).

3.3 Maintenance

Periodical check

To keep the unit working properly over time, it is necessary to have qualified personnel make an annual check that includes the following tests:

- The control and safety devices (gas valve, flow meter, thermostats, etc.) must function correctly.
- The fume extraction circuit must be fully efficient.
- The airtight chamber must be sealed
- The air-fume end piece and ducts must be free of obstructions and leaks
- The condensate evacuation system must be efficient with no leakage or obstructions.
- The burner and exchanger must be clean and free of scale. When cleaning, do not use chemical products or wire brushes.
- The electrode must be free of scale and properly positioned.
- The gas and water systems must be airtight.
- The water pressure in the cold water system must be about 1 bar; otherwise, bring it to that value.
- The circulation pump must not be blocked.
- The expansion tank must be filled.
- The gas flow and pressure must correspond to that given in the respective tables.

The boiler casing, panel and aesthetic parts can be cleaned with a soft damp cloth, possibly soaked in soapy water. Do not use any abrasive detergents and solvents.

Opening the casing

To open the boiler casing (fig. 29):

1. Undo the screws **(1)**
2. Open, turning the casing **(2)**
3. Lift and remove the casing **(3)**

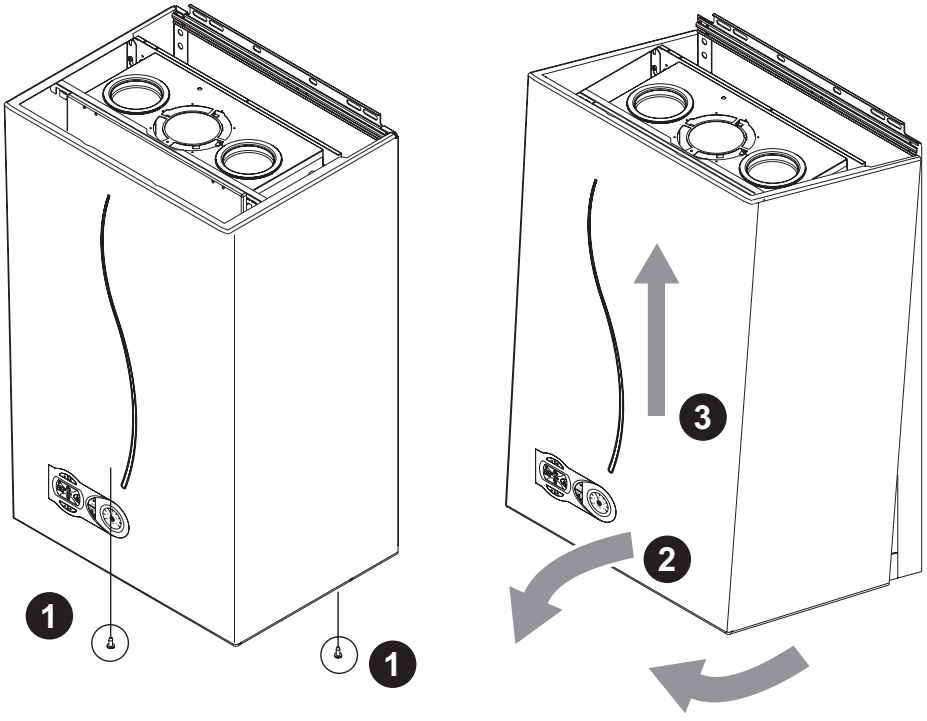


fig. 29 - Opening the casing

Combustion analysis

It is possible to analyse the combustion through the air sampling (**detail 2**) and fume sampling (**detail 1**) points shown in fig. 30.

To take the measurement:

1. Open the air and fume sampling points
2. Insert the probes
3. Press **the**"+" **and** "-" buttons for 5 seconds to activate TEST mode
4. Wait 10 minutes for the boiler to stabilise
5. Take the measurement

For natural gas the CO_2 reading must be between 8.7 and 9 %.

For LPG the CO_2 the reading must be between 9.5 and 10 %.

Analyses made with an unstabilised boiler can cause measurement errors.

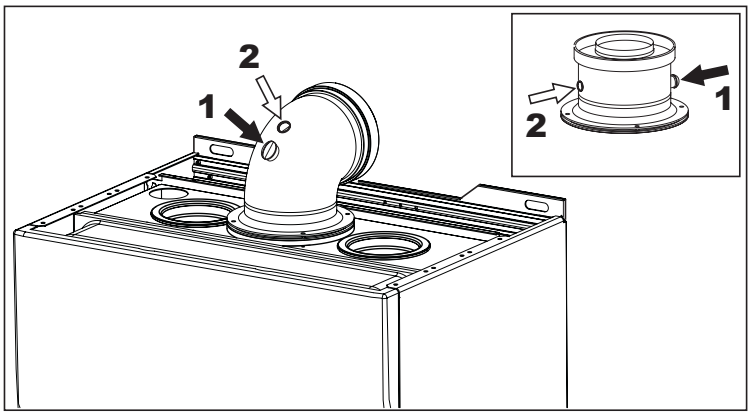


fig. 30 - Combustion analysis

3.4 Troubleshooting

Diagnostics

In case of operation faults or problems, the display flashes and the fault identification code appears.

There are faults that cause permanent shutdown (marked with the letter "**A**"): to restore operation just press the RESET button (detail 8 - fig. 1) for 1 second or RESET on the optional remote timer control if installed; if the boiler fails to start, it is necessary to first eliminate the fault.

Other faults (marked with the letter "**F**") cause temporary shutdowns that are automatically reset as soon as the value returns within the boiler's normal working range.

Table. 5 - List of faults

Fault code	Fault	Possible cause	Cure
A01	The burner fails to light	No gas	Check the regular gas flow to the boiler and that the air has been eliminated from the pipes
		Ignition/detection electrode fault	Check the wiring of the electrode and that it is correctly positioned and free of any deposits
		Faulty gas valve	Check the gas valve and replace it necessary
		Insufficient gas supply pressure	Check the gas supply pressure
		Trap clogged	Check the trap and clean it if necessary
A02	Flame present signal with burner off	Electrode fault	Check the ionisation electrode wiring
		Card fault	Check the card
A03	Overtemperature protection activated	Heating sensor damaged	Check the correct positioning and operation of the heating sensor
		No water circulation in the system	Check the circulating pump
		Air in the system	Vent the system
A04	Fume exhaust duct safety activated	Fault F07 generated 3 times in the last 24 hours	See fault F07
A05	Fan protection activated	Fault F15 generated for 1 hour (consecutive)	See fault F15
A06	No flame after ignition stage (6 times in 4 minutes)	Ionisation electrode fault	Check the position of the ionisation electrode and replace it if necessary
		Flame unstable	Check the burner
		Gas valve Offset fault	Check the Offset adjustment at minimum power
		air/fume ducts obstructed	Remove the obstruction from the flue, fume exhaust ducts and air inlet and terminals
		Trap clogged	Check the trap and clean it if necessary
F07	High fume temperature	Flue partially obstructed or insufficient	Check the efficiency of the flue, fume exhaust ducts and outlet terminal
		Fume sensor position	Check the correct positioning and operation of the fume sensor
F10	Delivery sensor 1 fault	Sensor damaged	Check the wiring or replace the sensor
		Wiring shorted	
		Wiring disconnected	
F11	Return sensor fault	Sensor damaged	Check the wiring or replace the sensor
		Wiring shorted	
		Wiring disconnected	
F12	DHW sensor fault	Sensor damaged	Check the wiring or replace the sensor
		Wiring shorted	
		Wiring disconnected	

Fault code	Fault	Possible cause	Cure
F13	Fume sensor fault	Sensor damaged	Check the wiring or replace the sensor
		Wiring shorted	
		Wiring disconnected	
F14	Delivery sensor 2 fault	Sensor damaged	Check the wiring or replace the sensor
		Wiring shorted	
		Wiring disconnected	
F15	Fan fault	No 230V power supply	Check the wiring of the 3-pole connector
		Tachometric signal interrupted	Check the wiring of the 5-pole connector
		Fan damaged	Check the fan
F34	Supply voltage under 170V	Power supply trouble	Check the electrical system
F35	Mains frequency fault	Power supply trouble	Check the electrical system
F37	Incorrect system water pressure	Pressure too low	Fill the system
		Water pressure switch not connected or damaged	Check the sensor
F39	External probe fault	Probe damaged or wiring shorted	Check the wiring or replace the sensor
		Probe disconnected after activating the sliding temperature	Reconnect the external probe or disable the sliding temperature
A41	Sensor positioning	Delivery sensor disconnected from the pipe	Check the correct positioning and operation of the heating sensor
F42	Heating sensor fault	Sensor damaged	Replace the sensor

4. Technical characteristics and data

4.1 Dimensions and connections

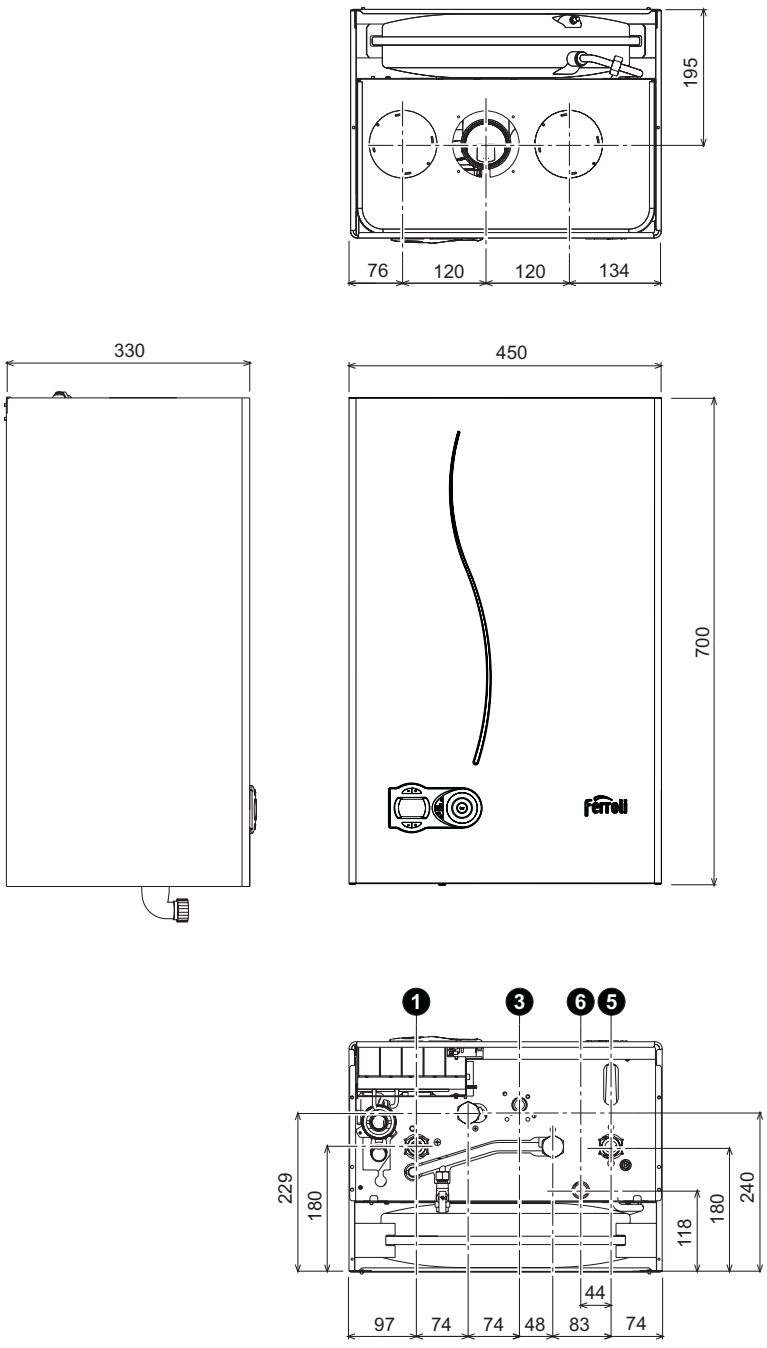


fig. 31 - Dimensions and connections

1 = Heating system delivery
3 = Gas inlet
5 = Heating system return
6 = Safety valve drain

4.2 General view and main components

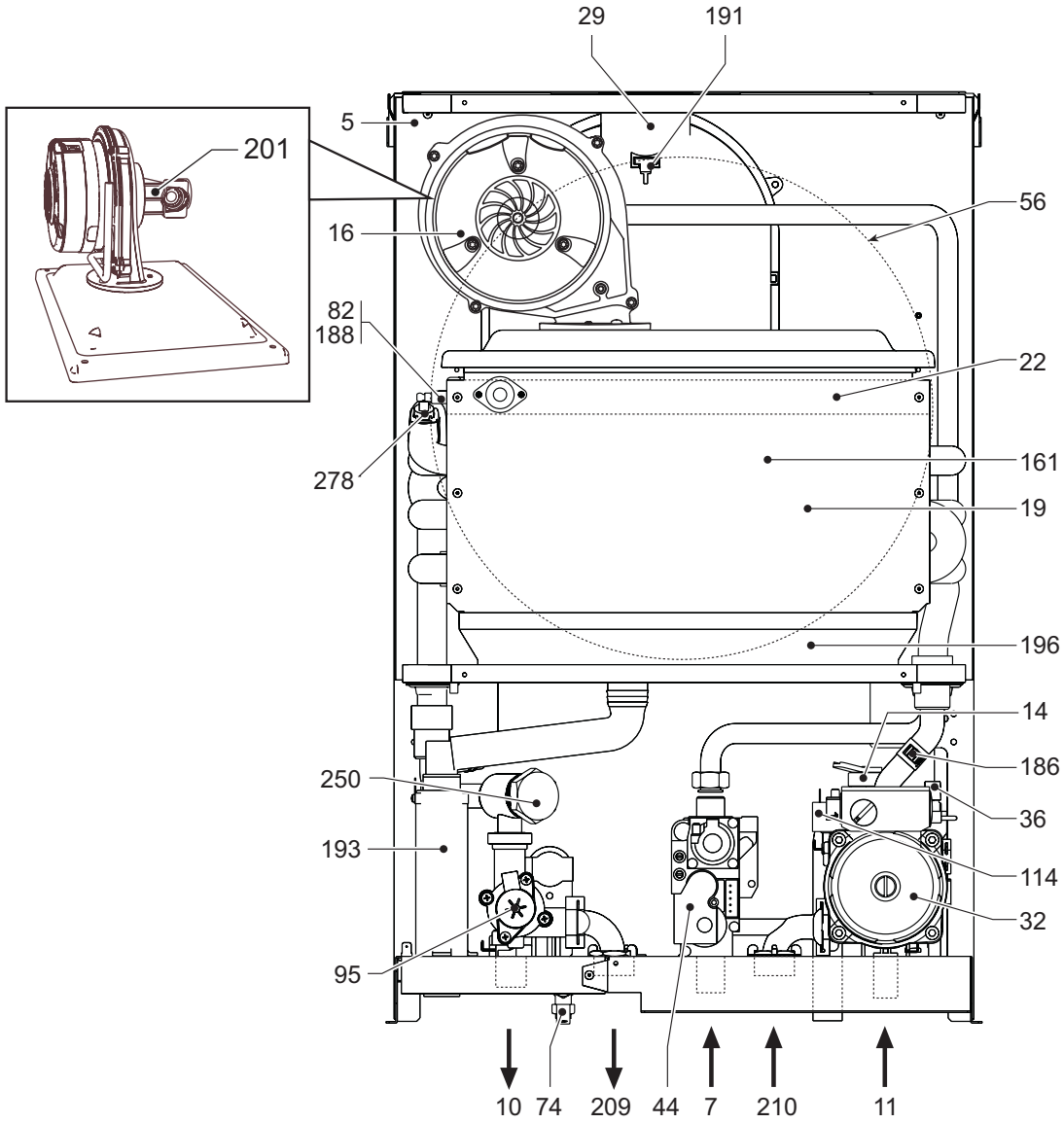


fig. 32 - General view

5 Airtight chamber
7 Gas inlet
10 System delivery
11 System return
14 Safety valve
16 Fan
19 Combustion chamber
22 Main burner
29 Fume outlet manifold
32 Heating circulator
36 Automatic air vent
44 Gas valve
56 Expansion tank
74 Heating system cock
82 Detection electrode
95 Diverter valve
114 Water pressure switch
161 Condensing heat exchanger
186 Return sensor
188 Ignition electrode
191 Fume temperature sensor
193 Trap
196 Condensate tray
201 Mixing chamber
209 Boiler delivery
210 Boiler return
250 System delivery filter
278 Double sensor (Safety + Heating)

4.3 Plumbing circuit

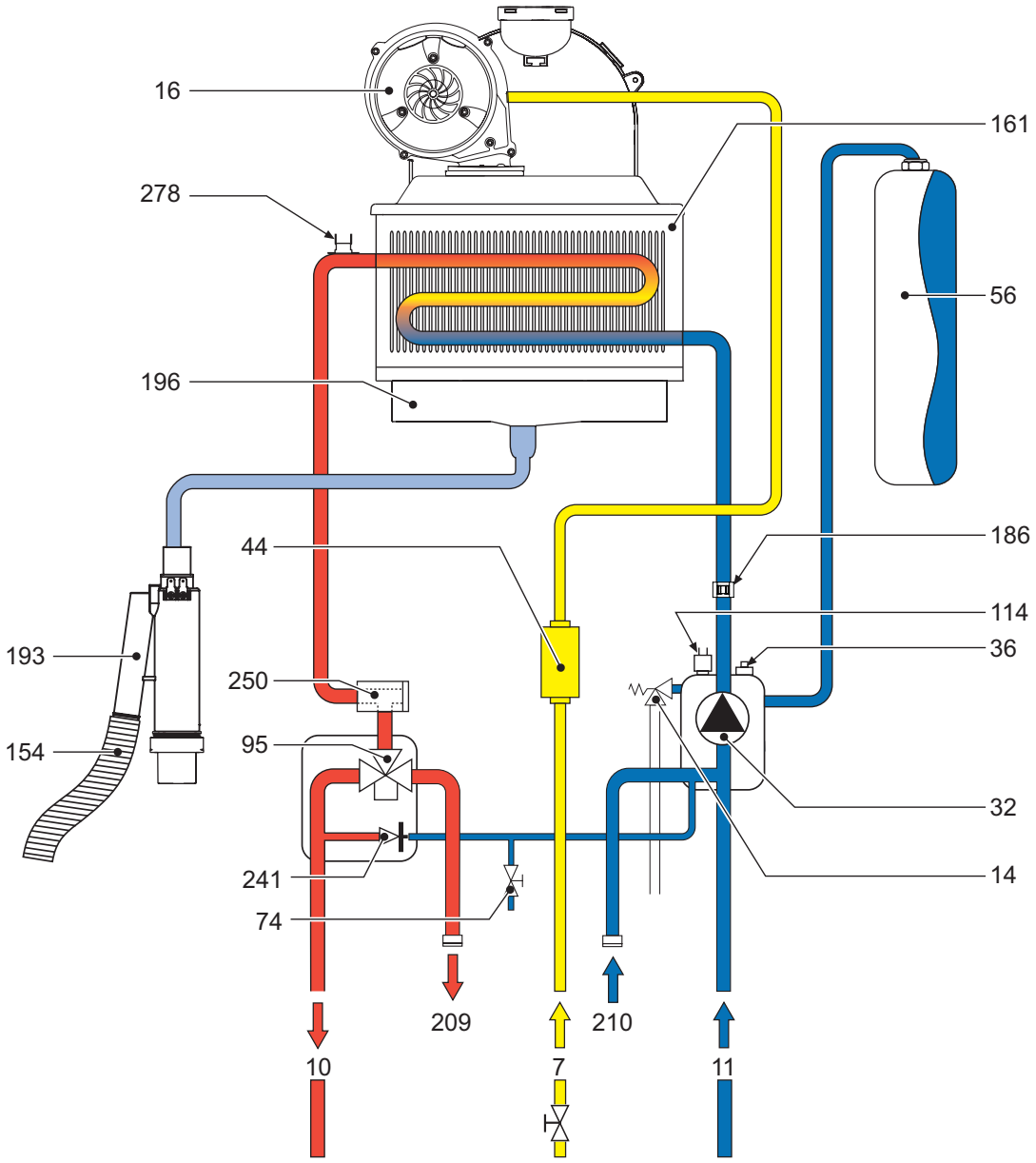


fig. 33 - Plumbing circuit

7 Gas inlet
10 System delivery
11 System return
14 Safety valve
16 Fan
32 Heating circulator
36 Automatic air vent
44 Gas valve
56 Expansion tank
74 Heating system cock
95 Diverter valve
114 Water pressure switch
154 Condensate outlet
161 Condensing heat exchanger
186 Return sensor
193 Trap
196 Condensate tray
209 Boiler delivery
210 Boiler return
210 Boiler return
241 By-pass
278 Double sensor (Safety + Heating)

4.4 Technical data table

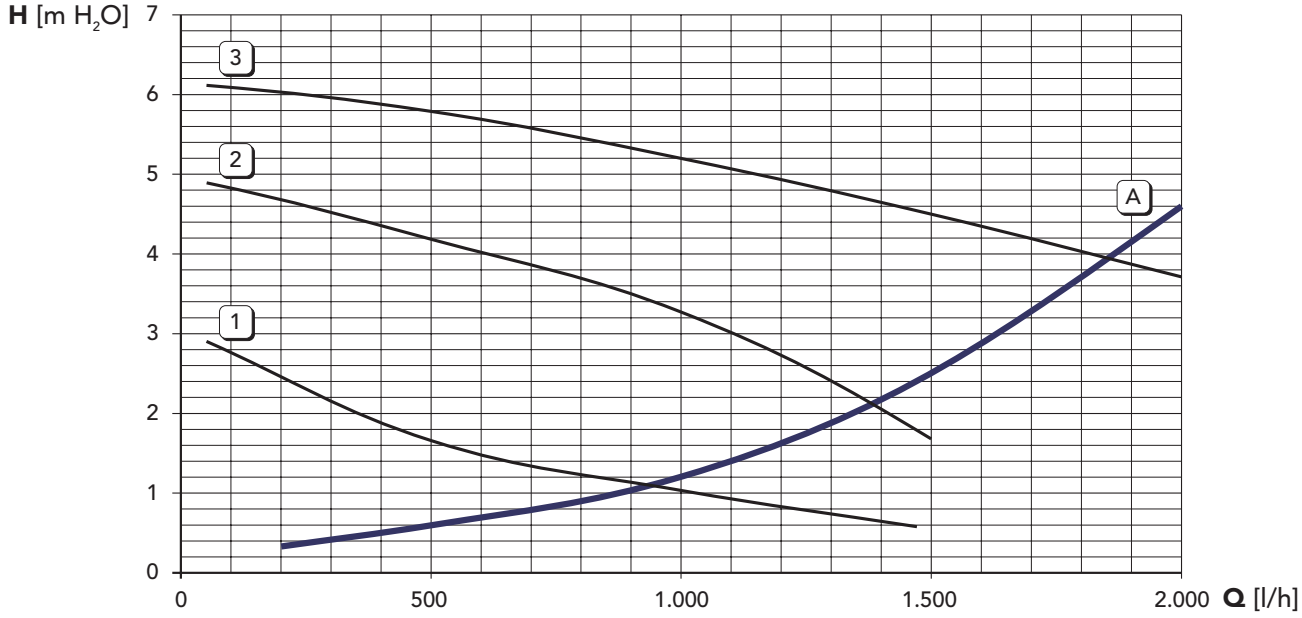
The column on the right gives the abbreviation used on the dataplate.

Data	Unit	Setting	
Max. heating power	kW	34.8	(Q)
Min. heating power	kW	6.5	(Q)
Max. Heat Output in heating (80/60°C)	kW	34.2	(P)
Min. Heat Output in heating (80/60°C)	kW	6.3	(P)
Max. Heat Output in heating (50/30°C)	kW	36.7	
Min. Heat Output in heating (50/30°C)	kW	6.9	
Max hot water heating power	kW	34.8	
Min hot water heating power	kW	6.5	
Max hot water heating power	kW	34.2	
Min hot water heating power	kW	6.3	
Gas feed pressure G20	mbar	20	
Max gas delivery G20	m^3 /h	3.68	
Min gas delivery G20	m^3 /h	0.69	
Gas feed pressure G31	mbar	37	
Max gas delivery G31	kg/h	2.73	
Min gas delivery G31	kg/h	0.51	

Efficiency class directive 92/42 EEC	-	★★★★	
NOx emission class	-	5	(NOx)
Max working pressure in heating	bar	3	(PMS)
Min working pressure in heating	bar	0.8	
Max heating temperature	°C	95	(tmax)
Heating water content	litres	2	
Heating expansion tank capacity	litres	10	
Heating expansion tank pre-filling pressure	bar	1	
Protection class	IP	X5D	
Supply voltage	V/Hz	230V/50Hz	
Electrical power input	W	140	
Electrical power input in hot water production	W	140	
Weight with no load	kg	41	
Type of unit		C13-C23-C33-C43-C53-C63-C83-B23-B33	
PIN CE		0063BR3161	

4.5 Diagrams

Circulating pumps head/ pressure loss



A Boiler pressure losses
1 - 2 - 3 Circulating pump speed

4.6 Wiring diagram

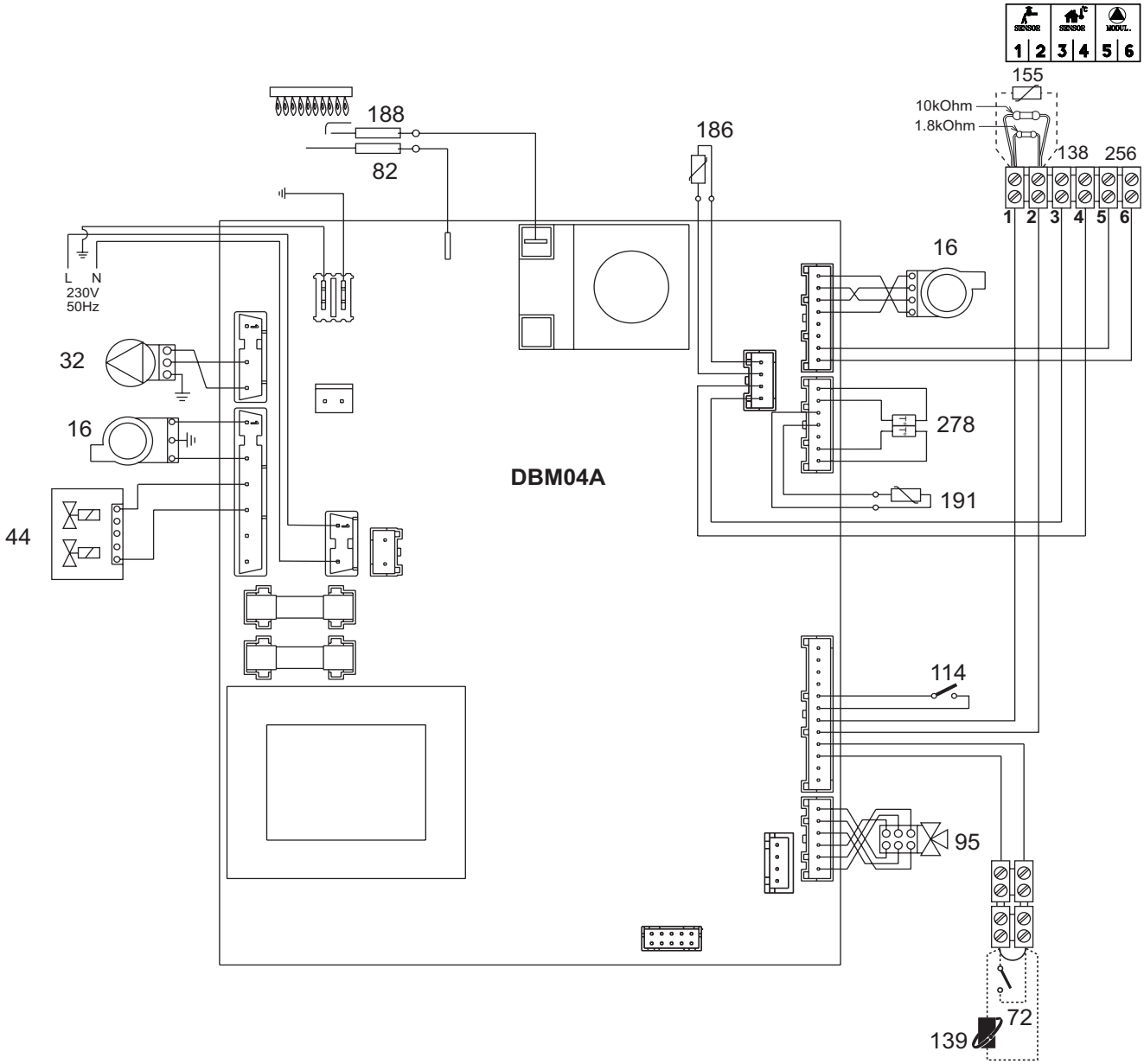


fig. 34 - Wiring diagram

Caution: Before connecting the **room thermostat** or the **remote timer control**, remove the jumper on the terminal block.

16 Fan
32 Heating circulator
44 Gas valve
72 Room thermostat
82 Detection electrode
95 Diverter valve
114 Water pressure switch
138 External sensor
139 Remote timer control
155 Hot water temperature sensor (optional)
186 Return sensor
188 Ignition electrode
191 Fume temperature sensor
278 Double sensor (heating + safety)
256 Modulating heating circulator pump signal